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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,757	04/15/2004	Brad A. Reger	5693P037X	1208
48102	7590	10/27/2006	EXAMINER	
NETWORK APPLIANCE/BLAKELY 12400 WILSHIRE BLVD SEVENTH FLOOR LOS ANGELES, CA 90025-1030			WALTER, CRAIG E	
			ART UNIT	PAPER NUMBER
			2188	

DATE MAILED: 10/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/826,757	REGER ET AL.	
	Examiner	Art Unit	
	Craig E. Walter	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

Drawings

2. The drawings were received on 15 April 2004. These drawings are deemed acceptable for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 13-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As for claims 13 and 14, the phrase "substantially in a space previously occupied" as recited in line 3 of claim 13 renders the claims indefinite, as one of ordinary skill in the art would be unable to determine the requisite degree to which the term "substantially" limits the scope of these claims. Furthermore, Applicant's specification provides no specific guidance as to where exactly "substantially in a space previously occupied" resides within the recited chassis per these claims; hence the

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Examiner is unable to definitively determine the metes and bounds of the claim limitation.

Claims 15-16 further limit claim 14, hence they are rejected for inheriting the deficiency of this claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by DeKoning et al. (US Patent 5,975,738), hereinafter DeKoning.

As for claim 1, DeKoning teaches a method comprising:

operating a storage system which includes a plurality of mass storage devices and a first storage server head to access the mass storage devices in response to client requests, wherein the first storage server head has ownership of the plurality of mass storage devices (referring to Fig. 1, the RAID subsystem (100), contains a plurality of controllers (i.e. heads – 118.1, 118.2), connected to a plurality of mass storage devices (110). The controllers receive access requests via the hosts (120.1, 120.2) – col. 6, lines 9-40. Each LUN within the array of storage devices is associated (i.e. assigned) to one of the two controllers as primary controller. The remaining controller is the secondary or redundant

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controller – col. 7, lines 13-22); and

reassigning ownership of at least one of the mass storage devices to a second storage server head, independently of a manner in which the second storage server head is connected to the plurality of mass storage devices (the redundant controller assumes ownership of the LUNs if a failure is detected in the primary controller –col. 7, lines 23-31).

As for claim 5, DeKoning teaches the reassigning ownership of at least one of the mass storage devices comprises using a software-based command to reassign ownership of said at least one of the mass storage devices (the determination if ownership needs to be reassigned is performed via a process of exchanging software commands as per col. 3, lines 43-64).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 7-9, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning (US Patent 5,975,738) as applied to claim 1 above, and in further view of Dimmick et al. (US Patent 5,193,050), hereinafter Dimmick.

As for claims 2 and 7, DeKoning teaches a method of reconfiguring a storage system, the method comprising:

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operating an integrated storage system which includes a plurality of mass storage devices and a storage server head to access the mass storage devices in response to client requests, wherein the storage server head has ownership of the plurality of mass storage devices (referring to Fig. 1, the RAID subsystem (100), contains a plurality of controllers (i.e. heads – 118.1, 118.2), connected to a plurality of mass storage devices (110). The controllers receive access requests via the hosts (120.1, 120.2) – col. 6, lines 9-40. Each LUN within the array of storage devices is associated (i.e. assigned) to one of the two controllers as primary controller. The remaining controller is the secondary or redundant controller – col. 7, lines 13-22);

disconnecting and removing the storage server head from the mass storage devices (the controllers are interchangeable so as to allow a failing controller unit to be easily disconnected and removed from the storage subsystem (col. 6, line 63 through col. 7, line 12));

connecting an external storage server head unit to the mass storage devices (DeKoning teaches connecting both a primary and a secondary controller to the storage subsystem. Once it has been determined that the primary controller has failed, the connection between the secondary controller and the storage units is enabled allowing for control to pass to the secondary controller – col. 7, lines 13-31. It is worthy to note that external storage controller (i.e. head) is in fact external, as it is external to the drives as shown in Fig. 1);

and using a command to reassign ownership of the plurality of mass storage devices from the storage server head to the external storage server head unit (the

determination if ownership needs to be reassigned is performed via a process of exchanging software commands as per col. 3, lines 43-64).

DeKoning however fails to teach the storage server head and storage devices as being installed in a chassis (as recited by Applicant in both claims 2 and 7).

Dimmick however teaches an enclosure for electronic subsystems in a data processing system, which he teaches the use of a single enclosure (i.e. chassis) incorporating several individual modules to form an integrated subsystem for data processing systems (col. 1, lines 7-11) – see also Fig. 1.

As for claim 12, though DeKoning teaches a storage server head (i.e. controller), he fails to specifically teach it as being implemented on a single circuit board. It would have been obvious to one of ordinary skill in the art at the time of the invention for DeKoning to integrate his controller (i.e. the CPU, memory and cache which comprise the controller) onto a single circuit board. By doing so, he could exploit the well-known benefits of integrated circuits utilizing a single circuit board, including improved interchangeability, and improved signal timing and integrity of the components.

DeKoning additionally fails to teach installing the controller within the chassis as recited by Applicant. Dimmick however teaches an enclosure for electronic subsystems in a data processing system, which he teaches the use of a single enclosure (i.e. chassis) incorporating several individual modules to form an integrated subsystem for data processing systems (col. 1, lines 7-11) – see also Fig. 1.

As for claim 13, though DeKoning teaches removing a failed controller and swapping it with another controller, he fails to teach swapping these controller within the

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chassis itself.

Dimmick however teaches an enclosure for electronic subsystems in a data processing system, which he teaches the use of a single enclosure (i.e. chassis) incorporating several individual modules to form an integrated subsystem for data processing systems (col. 1, lines 7-11) – see also Fig. 1.

It would have been obvious to one of ordinary skill in the art at the time of the invention for DeKoning to further include Dimmick's enclosure for subsystems into his own subsystem utilizing his method for detecting failures in a redundant controller. By doing so, DeKoning could benefit by having a fully integrated unit, capable of being quickly inserted and removed without requiring any changes to the remainder of the system as taught by Dimmick in col. 1, lines 28-40.

As for claim 8, DeKoning teaches using a command to reassign ownership of the plurality of mass storage devices as comprising reassigning ownership of the mass storage devices independently of how the plurality of mass storage devices and the external storage head unit are physically interconnected (the redundant controller assumes ownership of the LUNs if a failure is detected in the primary controller –col. 7, lines 23-31. Also note the determination to reassign ownership is performed via a process of exchanging software commands as per col. 3, lines 43-64).

As for claim 9, DeKoning teaches using a command to reassign ownership of the plurality of mass storage devices as comprising reassigning ownership of the mass storage devices without removing any of the mass storage devices (unlike his teachings for the controllers which are interchangeable, DeKoning does not require that the drives

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themselves be swapped out during the reassignment process (i.e. reassignment may occur either via software commands, or via physical swapping of the controllers)).

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning (US Patent 5,975,738) as applied to claim 5 above, and in further view of Brunelle et al. (US Patent 6,654,902 B1), hereinafter Brunelle.

As for claim 6, though DeKoning teaches arbitrating ownership of a plurality of disks between multiple controllers, he fails to specifically teach storing ownership attribute bits in the disks themselves.

Brunelle however teaches a system for persistent reservation IO barriers in which a storage device itself stores an ownership identifier depending on which resource (i.e. computer) has access to that device (col. 2, lines 21-51).

It would have been obvious to one of ordinary skill in the art at the time of the invention for DeKoning to further include Brunelle's system of persistent reservation IO barriers into his own method for detecting failure in redundant controllers using a private LUN. By doing so, DeKoning could exploit the benefits of preventing unauthorized access to his system by increasing the system's security via Brunelle's use of a registration key as taught by Brunelle in col. 1, lines 33-51.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of DeKoning (US Patent 5,975,738) and Dimmick (US Patent 5,193,050) as applied to claim 7 above, and in further view of Brunelle (US Patent 6,654,902 B1).

As for claim 10, through the combined teachings of DeKoning and Dimmick meet

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all the limitations of claim 7, they fail to specifically teach storing ownership attribute bits in the disks themselves.

Brunelle however teaches a system for persistent reservation IO barriers in which a storage device itself stores an ownership identifier depending on which resource (i.e. computer) has access to that device (col. 2, lines 21-51).

It would have been obvious to one of ordinary skill in the art at the time of the invention for DeKoning to further include Brunelle's system of persistent reservation IO barriers into his own method for detecting failure in redundant controllers using a private LUN. By doing so, DeKoning could exploit the benefits of preventing unauthorized access to his system by increasing the system's security via Brunelle's use of a registration key as taught by Brunelle in col. 1, lines 33-51.

8. Claims 3, 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of DeKoning (US Patent 5,975,738) and Dimmick (US Patent 5,193,050) as applied to claims 2 and 7 above, and in further view of Weber (US PG Publication 2003/0105931 A1).

As for claim 3, though the combined teachings of DeKoning and Dimmick teach all the limitations of claim 2, they fail to teach the second sever head as being external to the chassis.

Weber however teaches an architecture for transparent mirroring which utilizes a redundant controller, remote from the primary controller (see Fig. 1, element 106 and paragraph 0027, all lines).

It would have been obvious to one of ordinary skill in the art at the time of the

invention for DeKoning to further include Weber's mirroring method into his own method for detecting failure in redundant controllers using a private LUN. By doing so, DeKoning could benefit by preventing catastrophic system failure by mirroring critical data at a geographically remote location, hence enabling persistent access to critical uncorrupted data as taught by Weber in paragraphs 0001 and 0006, all lines.

As for claim 4, DeKoning teaches removing the failing unit once it's detected in order to transfer ownership to the redundant controller (col. 6, line 63 through col. 7, line 12).

As for claim 11, though the combined teachings of Dekoning and Dimmick teach all the limitations of claim 7, they fail to teach connecting the external storage server head unit to a second plurality of mass storage devices, wherein the external storage server head unit further has ownership of the second plurality of mass storage devices.

Weber however teaches an architecture for transparent mirroring, which utilizes a redundant controller, remote from the primary controller connected to mirrored data storage devices (see Fig. 1, element 106 and paragraph 0027, all lines).

It would have been obvious to one of ordinary skill in the art at the time of the invention for DeKoning to further include Weber's mirroring method into his own method for detecting failure in redundant controllers using a private LUN. By doing so, DeKoning could benefit by preventing catastrophic system failure by mirroring critical data at a geographically remote location, hence enabling persistent access to critical uncorrupted data as taught by Weber in paragraphs 0001 and 0006, all lines.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Talagala et al. (US Patent 6,732,289 B1) teach a fault tolerant data storage system.

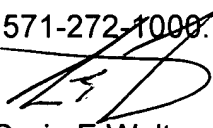
Tawil et al. (US Patent 6,625,747 B1) teach a computer storage system and failover method.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig E. Walter whose telephone number is (571) 272-8154. The examiner can normally be reached on 8:30a - 5:00p M-F.

11. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung S. Sough can be reached on (571) 272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Craig E Walter
Examiner
Art Unit 2188

CEW



HYUNG SOUGH
SUPERVISORY PATENT EXAMINER